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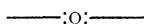
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varying quicksands, and then came to rest. Further on ran the other springs which also poured their waters in the creek flowing from the first one. On the left bank of this creek stood an old *adobe* enclosure, rectangular in shape, built by the Mormons some years before.

Two or three large cottonwood trees shaded the creek near the quadrangle. Here the bed of the stream was broken into a series of little rapids or falls, none exceeding four feet in height, formed by rocks of calcareous tufa.

At the foot of these miniature waterfalls was a quiet pool, about five feet deep and ten feet in diameter, used in former times by the Mormons as a baptismal font. The land along the banks of the creek had been cultivated, and at this time were seen the remains of irrigating ditches, which attest the industry and enterprise of this strange, and to our minds, deluded people. These fields are now overgrown with mesquite and thistles, the latter attract numberless goldfinches, humming birds and humble bees.

In the springs above enumerated, the reader has a sketch of a few of those in Southern Nevada. The springs of this inhospitable region are so few, that at one time or another, each one becomes, as it were, the polar star of the desert traveler, towards which he turns his face with inflexible determination.



THE NIGHT HERONS, AND THEIR EXODUS.

BY REV. SAMUEL LOCKWOOD, PH.D.

AMONG our showy birds, although far from graceful in many of its movements, is the night heron (*Nyctiardea gardeni* Baird). If fine feathers make a fine bird, then assuredly our *Nyctiardea* deserves consideration. The bird when adult is fully two feet long. It has a deep guttural cry, consisting of one syllable, slowly repeated. This circumstance afforded the old name given it by Nuttall, *Ardea discors*, as also its popular names of qua-bird, or quawk. It is also known as the black-crowned night heron, the crown of the head, and considerable of the back being a very dark green, almost approaching black. In the nuptial months, the bird flourishes from the hinder part of the head, flowing backwards, like so many natural "accidentals," three very delicate white

plumes, nearly ten inches long. If I might change the simile, these pretty white filaments are suggestive of the white streamers pendant from the chignon of some fantastic bride. And the two sets of adornments are afflicted with a similar perverseness; for the bridal toggery of the one will insist on getting twisted, and *Nyctiardea's* nuptial head-gear also will snarl into one. But in this instance the thing after all is quite natural and becoming. Each of these white, almost thread-like filaments, is nearly cylindrical, owing to an incurving of the edge of the feather; hence the three do have a habit of slipping into one another, and making, as it were, a pretty imbricated cord or cue of ivory whiteness. The general coloring of this showy bird is such as neither pen nor pencil can quite portray. Says Coues, who is a fine bird painter, when verbal pigments are concerned: "General plumage bluish-gray, more or less tinged with lilac; forehead, throat-line, and most under parts whitish." The bill is black, and the feet are yellow. You will find nothing verdant in the eyes of the night heron, although the space between them is of a greenish blue. As to the optics themselves, they are red. Does some one insinuate "that is the way with night birds?" Let such an one consider that generally the owls have bright yellow eyes.

It was three years ago, just as June, the busy bird month was opening, when, accompanied by two of our students, I set out for a visit to a famous heronry, some three miles in a south-west direction from New Brunswick, N. J. The neighborhood is called Three Mile Run, because of a tiny stream about that distance from the city. We went first to the farm house near by, where a colloquy something like the following occurred:

Self. "Do you know when the herons began to settle over there?"

Hostess. "Well, sir, you see it is so long ago since the herons came, that it really is not possible to say when they did settle, but they've been there 35 years to my certain knowledge."

Host. "Oh, wife, more than that: I remember them over 40 years; and there was father, who had known them long afore that. I'll be bound that heronry is 50 years old if a day. And since I've known them they've come and gone every year, never missing once."

Self. "Is that all the woods there were?"

Host. "Bless you, sir, no. Once that was as pretty a piece of oak woods as one need put eyes on. It covered many acres, and

we called it the Swamp. Just that grove where the herons are is all that is left of it. We never attacked the birds, so I suppose they got to understand us, and to know that they were welcome. The felling the timber and tilling the land has pretty much done away with the swamps. You see, there's only about two acres in that grove. But the herons were a good deal more numerous when the woods were bigger."

Hostess. "Yes, I remember when it was a'most deafening to hear them."

Host. "When we see them coming back in the spring, we know that corn-planting is nigh; and when they leave in the fall, it is usually time to husk."

With the two young men I now started for the heronry, but five minutes' walk distant. It was evidently once a swamp. The grove was a remnant of a large wood of red oak, *Quercus rubra*, and, as already stated, did not cover quite two acres of land. With an exclusiveness not unlike that of some wasted Indian tribe, these red oaks kept out every other kind of tree. They even pressed upon one another so closely, that the lower branches after a precarious growth, inevitably died and fell. Atrophy of the lower limbs was the invariable habit. Thus the trees with a small girth pushed up towards the sky, each one a slim mast about fifty feet in height, with a small dome of shining green leaves at top, the base of each little dome crowding upon its fellows. It looked to me like a garden supported on piles; but as the wind sprung up there was such a wave-like movement overhead, that I wished for a balloon view, when I fancied I should see an emerald ocean floating in the air.

But if in mid-air was a scene of beauty, one of quite another character was soon to greet our eyes. Everywhere in the grove the ground seemed as if plashed with drippings of whitewash. And the leaves and twigs of the scanty underbrush were stained with these unsightly blotches of white. This was the effect of the droppings of the birds, both the old and the young. It indicated a large consumption of food; and if fish makes good brain food, perhaps this may have some bearing on the commendable circumspection of these occupants of the top flat in this establishment. I was led to look for some peculiar effect on the plant life of a soil so dressed annually for a half century. But I failed to detect anything noteworthy.

As we entered the wood there arose a grand commotion. An

old bird, perhaps the patriarch of the tribe, sprang into the air with a startling qua! which, after a pause as if to gather assurance, was repeated—Qua! qua! qua! Up flew another, and another, then many, all joining in the one wild out cry of qua! qua! qua! as they circled in air, loath to let their nests be out of sight. It was a wild chorus of alarm, utterly unmethodical, but perfectly uproarious, while over the edges of the rude nests of sticks peeped hundreds of little callow heads in mute astonishment, as if to see what could be below to incite so great a tumult above. Almost in the heart of that small grove I counted fifty herons' nests. These nests were high up in the leafy domes already spoken of. In some instances I noted three, and even four nests in one tree. Some writers I find saying that in the breeding season, the quabird is less suspicious. Assuredly it seemed to me that these herons could not be more circumspect. To come upon them by surprise was just impossible. From a distance no one can see them in their leafy outlooks, but they can see you; and should one approach too closely, the nearest male bird will give the alarm.

I noticed that the females whose incubation was not completed did not leave their nests. I have no doubt that they were waiting further signals from above.

Query: What notice of change in the situation can a bird give whose whole vocabulary is contained in the one monosyllable, qua? But do not philologists tell us that in some of the dialects of "The Flowery Land," that even a monosyllabic word may have eight significations if spoken in so many different tones? Thus if a barbarian outsider might be allowed to improvise a bit of barbarous Chinese, one might say shoò, to mean lovely, or all right; and shoó, to signify awake, or all wrong. And pray why not as much in the bird lingo?

Here let me mention an incident. Not knowing that one of the party was behind us making a feint of climbing a tree with a nest in it, there was observed an increase of commotion in the air. To a question what are the quas doing, the answer returned was: "They are taking a bird's eye view of the situation." I requested the aspiring youth whose conduct had intensified the stir above, to climb the tree and get a young one from the nest, that we might see it. Now began that change in the bird talk. It was qua! still, but in a different tone, and one which was understood by the sitting birds, for they spring from their nests and

joined their companions in the air. As the youth neared the nest the wild monotonous cry became painful to me, and I was anxious to shorten the suspense of the poor birds. Clinging to the tree with both legs and one arm, with the free hand he took a young bird out of the nest, and held it at arm's length from the tree, that I might see the callow thing, which was about as big as a fat squab. I saw it—yes, and I saw more than I looked for. The downy little beast vomited upon me the topmost layer of his night's feeding. And even my philosophy sold me, for concluding that the mischief was done, I stood my ground, but the mischief was only begun; for after an extraordinary pause, layer number two, in a more advanced stage of digestion descended, which in a hurried manner I declined to receive. After another pause, the third and last installment followed. We now called to the young man to put the unmannerly little thing back in the nest. It had thrown up the remains of six fishes.

The above incident was called "a sell," and subjected the writer to some chaffing at a later date. Said a wag, as if in quest of knowledge—"Why does a young qua-bird vomit his dinner upon being disturbed"? To this the answer was: "I do not get it from observation, but have it from tradition, that some of the herons when pursued by the raptors, keep up a series of diversions by vomiting the contents of their stomachs in installments, much as the Russian dispenses the contents of his sleigh when pursued by wolves." Now what the young heron did, was done from mere instinct—not offensively, subjectively considered, although objectively it was offensive enough—but as a protection by way of diversion. That is, the young bird acted wholly from an automatic impulse of instinct. And what is instinct but inherited experience after being crystallized into habit? In a word, the frightened young quawk, simply did in a blind way what its ancestors had done with better methods. If there had been enough intelligence in that instinctive act to indicate purpose, then the intention would have been as against the youth who held it as a captive, and not at all as against the spectator of the act.

Although they indulge in varied food, yet these night herons are nocturnal fishers, and their fishing must be limited to the margins of streams, and in waters decidedly shallow. They sally out at twilight, though sometimes if the day is cloudy and dull, they will not wait till then. As they pass near, and sometimes over the farm houses, on their way for food, they indulge in their

peculiar cry, the effect of which on the stillness of the night, is somewhat weird; still it is neither so ghostly nor so ludicrous as that of the classic bird of night. And very industrious must these night fishers be, for with a voracious appetite of their own, and a good deal of really hard work to be sustained, their young also consume an enormous quantity of food.

In connection with the fishing of the night heron, I found a very curious item of belief among these persons whose acquaintance with the habits of the birds of this heronry reached so far back. It was this: that the quawk when fishing in the night stood in the shallow water watching for its prey, and was aided in the matter by a soft light which emanated from its legs and feet. We had heard of luminous understandings, but they belonged to the higher vertebrates. I was assured that this phenomenon had been witnessed, the observers being out coon hunting on a moonlight night, and I was asked if these birds had not the capacity of emitting light from some phosphoric source in the legs, in some analogous manner to the phosphoric emission of the fire flies, or lightning beetles. Having in a modest way expressed my doubt as to the phosphoric hypothesis, I ventured to suggest that the yellow legs of the bird when withdrawn wet from the water might have shone, reflecting the moonlight. But the phosphoric hypothesis held its ground, being regarded, and perhaps rightly, as the more erudite of the two.

My pupil, who climbed the tree to show me the young bird, a little later in that same season, secured one of the fledglings, which he successfully tamed. It became an interesting pet, though hardly of the amiable sort. It had the run of the premises, especially of the barn yard; and was blessed with the appetite of a glutton. To this insatiable craving, fowl, flesh and fish were alike acceptable. Though descended of kindred who had always wintered in the warm southern climes, the bird stood the winter, a severe one, admirably. In this way it met with experiences which were not at all inherited, and decidedly novel.

It hugely relished soft fresh meat when cut into convenient morsels. The same meat hung in the barn would get frozen. In this condition it had to be cut up with a hatchet. A bit of frozen fat thrown to the bird evoked conduct of a humorous character. Suspecting nothing, the bird went for the coveted morsel, when, after some queer contortions the half-swallowed delicacy would be suddenly eructed with the quaintest demon-

strations of astonishment and distress, much as a child who on an extremely cold day in winter, dancing with pain, complains that the door-knob has burnt his fingers. But though embarrassed by the situation, the young qua would repeat his efforts to get the frozen meat well down, until success resulted, when he would come for more; so that in this conflict of bird thinking, the judgment that the meat was good prevailed. In fact, this bird's experience with frozen meat was not unlike daft Jerry's first acquaintance with ice cream: "This pudding *is* good; but such a pity it got froze!"

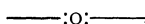
A very impudent, bossy bird, did the young qua grow up. Through the winter months the arena of his daily exercises was the barn-yard, which also was the scene of occasional night activities quite annoying to the more orderly disposed denizens of the place. His movements, even when "feeling good," were always awkward, and in no sense graceful; while from the depth of his inner consciousness was evolved a conduct so absolutely graceless as to almost indicate a deep-seated depravity. He would pursue the domestic animals, harrying the poultry and the old dog, presenting his formidable bill to those who owed him nothing; not even their good will. He knew his young master well, and paid him a sort of deference which he did to no one else. But though there was a kind of attachment, affection there was none. In fact his master was simply his feeder, to whom he was drawn by a very active appetite; this craving for food satisfied, even his keeper was but little more to him than other folks.

At length the cold season was over, and my young friend was glad to know that he had wintered his charge safely. He had begun to speculate how much longer he would have to keep the young qua bird ere it would attain to the plumage of its parents. The spring is well advanced, and the pet is about ten months old. See it is looking skyward and southward. Nay, it seems listening. Sure enough, the cry of qua! is heard in the air. The herons are coming. That cry is from the avant courier of the returning community. As the young bird looks up it is evidently undergoing a change in its feelings. There is another cry as if from the second outrider of the approaching host. The pet heron seems well nigh beside itself. It has never seen the "sunny clime," but it has caught that mysterious passion, the semi-annual frenzy of these birds. Its bird nature seems suddenly developed—and the bird soul is now above pellets of frozen mutton, and

the communion of fowls and dogs. Now the qua cries are thickening in the air, and the herons are coming fast. All this is too much for the young bird, so he is on the wing too to join his tribe. Albeit kindnesses received, he has cut himself from the white man and his ways. One would like to know how, with his superior education, this young person conducted himself; also how those illiterates, the old quas, received him. Well, this much must be said, as affairs will prove in a few days—the youngster has rejoined his tribe on the eve of an event the most remarkable in its history, one which might afford scope for the best exercise of bird wisdom, whether inherited or acquired.

On my table, at this writing, lies a pretty egg, which seems to give inspiration for my task. It is really beautiful for its symmetry, also its one attractive color, with neither spot nor stain. The larger diameter is fifty-two m.m., or two and one-sixteenth inches; the lesser diameter is forty m.m., or one and nine-sixteenths inches. Of the color I should have said above, it is a lustreless, waxy pea-green; though some call it a sea-green. And what an interesting object it is to me! and how sad is this interest! At the beginning of June in our Centennial year, 1876, my pupil who acted as guide to the heronry, brought me this egg, and with it the startling intelligence that the herons had gone! The community returned at the usual time, and had begun nesting. It happened that trade being dull in New Brunswick, many operatives were out of employment, and of these, not a few spent their time in a wanton destruction of the birds. Some went to the heronry, although strictly private property, and near the homestead of its owner, and in despite of his earnest remonstrances, a few shots were fired in the heronry. I am told that not more than two herons were killed. Had this happened away from their nesting place that would have been of less moment. But here in their cherished home, it was too much for these birds, so timid, and so circumspect. But have birds feelings? Who can doubt it? Doth not God care for birds? Verily, “your Heavenly Father feedeth them.” What a resolution was that taken by these birds, every one of them. And how grandly prompt the performance. Fitting hour it was too for so sad an act—they left their home in the night—thus disrupting the bliss of the nuptial month by accepting a homeless uncertainty. That entire colony abandoned the spot where they and their ancestors had dwelt for fifty summers. In premature maturity one mother

bird at least had been compelled to lay her eggs, and then must leave them behind. And this pretty treasure on my table is one of them. Interesting, was it said? Nay, is it not historic, a memento of this remarkable exodus of the night herons from their almost romantic heronry at Three-mile Run, New Jersey. Do you ask, "Did they hold together as in a well-ordered retreat? And did they establish a heronry elsewhere? Or did the spirited community dissolve itself into the isolation of single pairs? And finally, where did they go?" Well, just these are the questions which we are aching to find out. Meanwhile, let this much go on the record, of the time, circumstance, and spirit of the exodus of this ancient colony of birds.



VARIATIONS IN THE NESTS OF THE SAME SPECIES OF BIRDS.

BY DR. T. M. BREWER.

IN the present brief paper I propose to deal more with facts than with theories. I leave to others to make such deductions therefrom as may suggest themselves. When one cannot, to his own satisfaction, point out the reasons that can fully account for indisputable facts, it seems to be the safer course to be content with only taking cognizance of natural phenomena, just as they impress our senses. The legitimate scope of the naturalist is first correctly to describe isolated facts as they present themselves. To seek to investigate the laws that unite these, though always tempting, is not always safe. The homely advice: "Never to prophesy unless you know," is applicable to the case. There is no worse bondage to the student of nature than to be a slave to theory. The danger of a "little learning" is of its leading to unwarrantable deductions, and then the temptation to color facts to suit preconceived opinions may become one of the besetting weaknesses of our human nature, against which it behooves naturalists especially to struggle manfully.

From time immemorial the theory has been prevalent, and generally accepted, that the constructions of all animals, man excepted, are the inevitable results of a faculty called instinct. On the other hand it is claimed that all the constructions made by man are due to another faculty known as reason. To this I am